POST-NEWSWEEK

CABLE

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March 20, 1995

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street N.W.
Washington, D.C. 20054

Re: Compatibility Between Cable Systems and Consumer Electronics
Equipment, ET Docket 93-7

Dear Mr. Caton:

On March 16, 1995, Ted Hartson, Senior Vice President, Post-Newsweek Cable and Walter Ciciora, Co-Chair of the Cable-Consumer Electronics Advisory Group (C3AG), met with Richard Smith, Chief of the Office of Engineering and Technology (OET) to discuss the Decoder Interface standard and the status of C3AG activities. The discussion reviewed the command set issue, including the importance of an open, uncensored, signaling path from the "consumer's couch" to the setback devices. Alan Stillwell, OET, and Loretta Polk, National Cable Television Association, also attended the meeting.

The enclosed material on the command set issue was provided to the meeting participants. Please file this document in the record of the above-captioned proceeding.

Sincerely,

Ted Hartson

Ted Hartson

Enclosure

THE COMMAND SET PROBLEM

The most difficult issue in the entire Decoder Interface standard has been the "command set". Much of the problem's complication comes from not using the same terminology and not listening to what each other is saying.

When cable spoke of the "command set", it meant the complete communication path from the subscriber to the plug-in Decoder Interface module. This is evident from looking at the first submission made by cable to the consumer electronics side on 4/29/94. The consumer electronics side, on the other hand, insisted that "command set" means only the electrical signals that pass back and forth on the Decoder Interface connector, nothing else. When pressed about remote control signals, they took the position that those signals were beyond the scope of the discussion.

The "command set" submitted by the cable side to the consumer electronics side on 4/29/94 was generated after ten meetings and conference calls with set top box manufacturers and cable operators to list the minimum set of commands necessary to support services currently offered and those designed into boxes already in production. It contained a dozen "soft keys" to be defined flexibly for future applications. The cable side was astonished when the consumer electronics side objected and came back with a *sub set* of the commands. It is even more astonishing to see the EIA claim that their set is flexible and fully implements all the commands needed by cable. They speak from no experience since they do not create or offer services. They further claim that the cable side has never offered examples of missing commands. This is not true. In the General Instrument FCC ex parte filing of November 23, 1994, over fifty missing commands were listed. Just one simple example proves the point. As interactive MultiMedia services become available, it is impossible to conceive of not needing the alphabet. The command set does not support the transmission of the alphabet except in the most crude of ways. A set top box would have significant advantage over the "cable ready" implementation, making "cable ready" a clear second class citizen.

If the cable side accepted the EIA sub-set, it would be excluding or at least severely hampering services currently offered to subscribers or designed in boxes currently in production! Consumers who purchased a "cable ready" TV or VCR and used it with a Decoder Interface module would be disadvantaged relative to consumers who had an old TV with a set top box! That doesn't seem to make sense, especially since the Cable Act requires cable operators to advise consumers of compatibility problems they might encounter. In compliance with that rule, cable would have to warn consumers to be cautious about purchasing a "cable ready" TV or VCR and to expect that under some very likely circumstances, they should expect to need a set top box anyway.

The 4/29/94 requirements document listing cable's needs for the command set made it clear that cable was not expecting any buttons to be assigned on the remote controls that come with TVs or VCRs. What cable needs is a published definition of the IR signals it requires. If sufficient buttons were not included in the TV or VCR remote control, the service provider would supply another remote control which does the job.

The consumer electronics side tries to argue that cable services could be redesigned to fit inside the constraints created by their limited command set. This fails to recognize that the set top box will be deployed long before the "cable ready" TV and VCR and can't be changed to accommodate the access methods introduced later by these products without great expense and

inconvenience. It also denies the importance of "look and feel" in the creation of services. The programmer and the cable operator would be denied the ability to create an identity for their programs and services. A more serious complication is that each brand of TV and VCR (in fact the various models within brands) could have different methods of accessing services. The consumer might have to learn different procedures for service access when using his old set top box, his new TV and his new VCR. He may require a different method for each separate TV or VCR. This is a prescription for mass confusion and an unnecessary complication for the consumer.

Symmetrical Fears

From the very beginning of the work on the command set, the service provider side has been concerned about ensuring that the consumer who purchases a "cable ready" product has the same access to services as the consumer who has an older -- or new, inexpensive, non-cable ready -- TV and a set top box.

There are symmetrical fears. The service provider is concerned that consumers may not have access to all services with a "cable ready" product. Alternatively, the access may be limited or made inconvenient or cumbersome. The consumer electronics manufacturers are concerned that some services may require a separate remote control which may not include access to some TV or VCR features. The correct answer to both of these symmetrical concerns is to let the consumer decide!

When consumers purchase new TVs or VCRs, scrambling is usually not present. Instead the products are fed with an off-air antenna or a bank of laser disks players. The consumer is steered to features and functions which he finds attractive. The product goes home and is connected to the service provider. If scrambled services are involved, the service provider installs a set top box. In the future, a Decoder Interface module may be installed or the subscriber may self-install it. If the consumer electronics remote control provides satisfactory access to the services the subscriber desires, everyone is happy.

If, on the other hand, there are services which are not accommodated by the "cable ready" TV and the remote control which came with it, the consumer may rent or purchase or be given a different remote control. If the new remote control gives full access to all of the TV or VCR features which the consumer values, the remote control that came with the TV is placed on the shelf and there is another happy ending.

If, there are features in the TV or VCR which are desired and not easily accessible through the remote control supplied by the service provider and there are services not easily accessible through the remote control which came with the TV or VCR, the consumer must make a choice. The first choice is between the features in the consumer electronics product which are not readily accessible in the one remote control or the programming from the service provider which are not available with the other remote control.

There are other alternatives. If either the consumer electronics remote control or the service provider's remote control has a learning feature, it can absorb the commands from the other device. If neither has the ability to "learn", a third party remote control can be acquired for the cost of one or two pizzas.

OPEN "COUCH TO MODULE" COMMUNICATIONS

Only open, uncensored "couch to module" communications allows the consumer to have full access to programming offered by service providers of all types and to features included in "features boxes' sold at retail. If the TV's or VCR's microprocessor becomes a gatekeeper and decides what signals are allowed to pass from consumer to plug-in module, the Decoder Interface is crippled and inherently limited. It cannot accommodate the exciting new interactive and MultiMedia services which are just a few years away. This censoring could be a conscious design to limit the capability of the plug-in modules or simply an unintended consequence of not anticipating the needs for control signals required by a new service. The fundamental difficulty with a microprocessor installed between the IR receiver and the Decoder Interface plug is that it must recognize the IR signal before it can convert it into an electrical signal. If the microcomputer has not been "programmed" to recognize a signal, that signal does not make it through the "gate".

There are a variety of ways of accomplishing open, uncensored "couch to module" communications. The simplest to understand and the least structured is the IR by-pass. Next on the scale is the IR Pass Through concept. This is also the approach which has the most emotional opposition from the consumer electronics side. A closely related approach is the IR Twin. A more structured approach, which would require some degree of uniformity, is the addressable ASCII method. The most structured approach is the Remote Control Standardization scheme.

IR By-Pass

The IR by-pass is a separate IR detector included with the plug-in module. It is affixed onto the TV or VCR with double stick tape and connects directly to its appropriate module with a pig tail of wire. This has also been called a "Killroy Module" after the World War II cartoon character. Some have called it an IR Periscope since it peers up over the top of the TV or VCR. While this method works, it is clumsy. The IR receiver is likely to fall off or get its wire snagged while moving components. The double stick tape is likely to mar the finish of the TV or VCR If there are multiple modules, there may be a need for multiple IR receivers. Then there is the issue of aiming of the remote control. The consumer has been taught to aim it at the TV or VCR. The location of the separate IR receiver would have to be such that it is reliably illuminated by the remote control.

The cable side has not suggested the IR By-Pass, despite the EIA's ex parte filing claiming that the NCTA has made such a proposal. This is simply because it is the method of last resort. There is no need to propose it since this approach is totally separate from the Decoder Interface standard. It has no impact on the TV or VCR or on any of the other modules. It requires no agreement between the two sides to work. Each module manufacturer is free to do this as it sees fit.

Another implementation of the IR by-pass simply takes a modified set top box and puts it on top of the TV or VCR. The modification is the addition of a Decoder Interface connector on its back and a cable which goes to the TV or VCR. Likely the tuner will stay in the set top box since there is little to be saved by removing it. It would be more costly to produce and stock two models, one without a tuner for Decoder Interface application, and another with a tuner for use with "non-cable ready" TVs and VCRs. Several problems arise with this approach. First it appears to do little good except it allows the consumer to use the tuner and remote that came with his TV or VCR. It's a little difficult to understand why that's such a world renewing

improvement! If the No Separate Charge rule is applied, this would be very expensive for cable operators!

IR Pass Through

The theory behind the IR Pass Through is very simple, but probably widely misunderstood. It is merely a facilitation of the current situation to reduce clumsiness and the potential for error.

Firstly, the IR Pass Through was not meant to replace the current command set approach, merely to augment it. Thus the remote control which came with the TV and VCR still controls the TV and VCR. The signals which are emitted by that remote control still do what they were intended to do. The Decoder Interface command set which has only evolved to the point where it concerns electrical signals going back and forth through the Decoder Interface plug, continue as designed. They are not replaced.

If the On Screen Displays (OSD's) and buttons on the remote control supplied with the TV or VCR are sufficient for the services a particular subscriber wishes, then the IR Pass Through remains a capability which ensures unlimited future expansion.

If the consumer electronics manufacturer created a superior method of accessing the services the owner of the TV or VCR desires, the consumer is free to use that method and again the IR Pass Through remains a capability which ensures unlimited future expansion.

If the consumer wants a service which has not been anticipated by the command set and the TV or VCR remote control, then -- and only then -- the supplementary nature of the IR Pass Through comes into play. Then the signals which are not available through the normal means are provided by a supplementary remote control. It is in everyone's best interests to avoid the expense and inconvenience of another remote control. But if it becomes necessary, the option is there.

The consumer electronics side has objected that the IR signals will cause interference with the TV or VCR functions. This is simply not likely since the current situation involves a stack of TV, multiple VCRs, set top box, laser disk player, CD-I player, high fi, surround sound system, video game, etc., etc. all in a pile. When the consumer grabs one of his many remote controls, he aims it in the general direction of this pile, all of the IR receivers are illuminated by each button push. All of the remote controls cause some electrical signal to be sent to the microprocessor in the TV or VCR. It then decides whether the signal is for the TV or VCR or whether it is to be ignored. The IR Pass Through approach simply implores that if the signal doesn't belong to the TV or VCR, it should be passed on to the plug-in modules for their further processing.

A broad range of IR signal characteristics will be defined which will allow this system to work well. If there is concern about this, an industry group can narrow the range of parameters so that reliable operation is assured. The implementation could be relatively loose or fairly structured. The important point is that there is no limit to the nature of the signals that could be conveyed. There needs to be a "freedom of IR speech" principle invoked.

IR Twin

An alternate proposal which would eliminate any consumer electronics concern for confusion to the TV or VCR microprocessor is to provide a standardized second IR receiver (IR Twin) which is wired directly to the Decoder Interface connector without passing through the

microprocessor. This is simply the IR By-Pass method with the disadvantages listed above removed. The cost increment is about a dollar. The normal "command set" path through the TV still is used. The IR Twin doesn't replace it. Supplementary signals are provided in those cases where needed. The benefit is assured communication between consumer and his plug-in modules.

Addressable ASCII

The addressable ASCII approach is more structured. Under it, the remote control parameters would be closely defined so that anyone could make a remote control that addresses the TV or VCR and put signals into it that can be reliably passed on to plug-in modules. The signal consists of two parts, an address and a message. The address needs to be at least four bits in length since the Decoder Interface is designed to support up to ten plug-in modules plus the TV or VCR itself. The message should be from eight to ten bits in length. The eight bit ASCII set used by computers would be included.

A method of automatically assigning addresses to plug in modules is desirable so that the consumer need not think about nor understand the methodology. Perhaps the TV or VCR is in charge of maintaining a small data base and assigning the addresses.

This method requires more inter-industry agreement, but should not be too severe of a technical task once the political decision to do it is made.

Remote Control Standardization

The consumer electronics side has been clambering for standards for digital video and, more recently, for set top boxes. Both of these involve embryonic technologies and services which have very uncertain futures since we do not know what the consumer will want.

However, remote control technology is a mature technology. Acoustic, IR and RF methods have been in use for decades and have been produced in the hundreds of millions. If there is a technology ripe for standardization, this is it! This final method of achieving an open, uncensored "couch to module" communications is the most structured and requires the most inter-industry cooperation. But this standardization task is trivial compared to attempting to standardize digital video or set top boxes. If this technology is not subject to standards, there can be little hope for standardization of the more uncertain aspects of cable service.

Non IR Control

It is frequently mentioned that the remote control may not be based on IR signaling. Two answers are possible. First, a supplementary IR receiver with wires to the Decoder Interface plug would add roughly a dollar to costs. This is the most desirable approach since it has the fewest limits and is at a mature, cost reduced stage. It creates a common access method available on all "cable ready" products. The second, less desirable, approach is to require that "cable ready" products utilize published, open, uncensored protocols so that anyone can produce remote controllers based on its technology for communication with plug-in modules.

This standardization of IR has been accomplished rapidly and efficiently in the computer industry by the IR Data Association (IRDA). Computer products and peripherals such as printers can communicate with each other without physical wire connections. A contentious situation with

several competing standards proposals was resolved in the best interests of consumers and the business. The IRDA model should be considered in the interests of video consumers as well.

It is ironic that the consumer electronics side should be so uncertain of the future of IR remote controls and at the same time support the concept of the IF freeze on cable supplied remote set top boxes

REQUIRED ON CABLE READY ONLY

This is an extremely important point. While many of the requirements for being "cable ready" add some expense, the expense does not apply to all TVs and VCRs. It only applies to the consumer electronics products which are sold as "cable ready" or some similar designation. The FCC has not required any of the manufacturers to produce any "cable ready" products. A manufacturer who sees this as excessively burdensome can simply avoid making "cable ready" products. It should be appreciated that the added expense of "cable ready" capability mainly comes from bringing the performance of broadcast quality circuitry up to the level cable has installed in set top boxes for years! The increments in cost principally are for providing adequate results in the cable environment.

A similar choice is not available to the cable side. The proposed FCC rules would *require* cable operators to make available plug-in modules to any subscriber who purchased a "cable ready" product and requested them. Furthermore, the FCC is considering a No Separate Charge approach which places a truly unsymmetrical burden on the cable side. As a final point of unfairness, in its May 4 Report and Order, the FCC clarified that these rules only apply to cable operators. Specifically, they do not apply to telephone companies and the video dial tone service!

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